Assignment 4

Due Monday 2 October 2023, at the start of class

Please read Lectures 4,5,6,7 in the textbook *Numerical Linear Algebra* by Trefethen and Bau. This Assignment covers the SVD (Lectures 4 & 5) and projectors (Lecture 6).

DO THE FOLLOWING EXERCISE from Lecture 4:

- **Exercise 4.4**

DO THE FOLLOWING EXERCISES from Lecture 5:

- **Exercise 5.1**
- **Exercise 5.2**
- **Exercise 5.3**

DO THE FOLLOWING EXERCISES from Lecture 6:

- **Exercise 6.1**

DO THE FOLLOWING ADDITIONAL EXERCISES.

P9. **(a)** Give an example of a projector which is not an orthogonal projector.

(b) Show that if P is a projector and λ is an eigenvalue of P then $\lambda = 0$ or $\lambda = 1$.

(c) Show that if a projector is invertible then it is the identity.